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IN THE UNITED STATES PATENT & TRADEMARK OFFICE

IN RE APPLICATION OF	:	
JOHN A HUGHES, ET AL.	:	EXAMINER: MAUREEN GRAMAGLIA
SERIAL NO: 10/673,376	:	
FILING DATE: SEPTEMBER 30, 2003	:	GROUP ART UNIT: 1792
FOR: METHOD AND SYSTEM FOR INTRODUCTION OF AN ACTIVE MATERIAL TO A CHEMICAL PROCESS	:	

PRE-APPEAL BRIEF REQUEST FOR REVIEW

COMMISSIONER FOR PATENTS
ALEXANDRIA, VIRGINIA 22313

SIR:

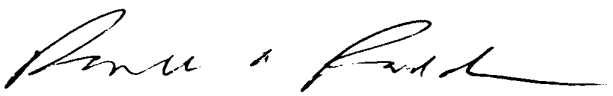
Applicants request review of the final rejection in the above-identified application. No amendments are being filed with this request. This request is being filed with a Notice of Appeal.

The review is requested for the reasons stated on the attached sheets. No more than five (5) pages are provided.

The undersigned is the attorney of record.

Respectfully submitted,

OBLON, SPIVAK, McCLELLAND,
MAIER & NEUSTADT, P.C.



Steven P. Weihrouch
Attorney of Record
Registration No. 32,829

Ronald A. Rudder, Ph.D.
Registration No. 45,618

Customer Number
22850

Tel: (703) 413-3000
Fax: (703) 413 -2220
(OSMMN 06/04)

THE EXAMINER'S POSITION ON THE OBVIOUSNESS OF THE CLAIMED INVENTION(S) IS CONTRARY TO CASE LAW WITH REGARD TO STANDARDS FROM CASE LAW SHOWING THAT THE CLAIMED INVENTION IS NON-OBVIOUS.

In the outstanding final Office Action, Claims 1, 3, 11, 18, 20, 22, and 40-43 were rejected under 35 U.S.C. § 103(a) as being unpatentable over U.S. Patent No. 5,556,500 to Hasegawa et al in view of Kumar et al (U.S. Pat. No. 7,227,097).

Claim 1 as presently pending defines:

> 1. A processing element for a semiconductor manufacturing system, said processing element comprising:
> a cylindrical unit including a passive polymeric component and an active component;
> said cylindrical unit having a first radially-extending surface and a second radially extending surface opposite the first radially-extending surface, wherein an inside diameter of the cylindrical unit forms an opening for disposition of the cylindrical unit around a substrate position in the semiconductor manufacturing system and the second radially extending surface is a substantially planar surface for disposition on a substrate holder in the semiconductor manufacturing system;
> said passive ***polymeric*** component configured to ***erode when exposed to a plasma process in said semiconductor manufacturing system***; and
> said active component included as a part of said passive component and configured to alter the chemistry of the processing when exposed to the plasma process. [Emphasis added.]

1) Hasegawa et al clearly state at col. 1, lines 25-33, that:

> A focus ring (electric field compensating ring) is provided to surround the wafer on the lower electrode, thereby to effectively direct the reactive ions onto the wafer. It ***is necessary*** that the focus ring have anti-corrosion properties ***(anti-chemical properties with high resistance to etching gas)***, anti-plasma properties, heat resistance and electrical conductivity.

Hasegawa et al, at col. 9, lines 36-47, also state:

> As has been described above, the in-plane uniformity of etching characteristics such as etching rate and etching anisotropy can be improved by employing the focus ring 102 comprising a compound structure of inner and outer parts 104 and 106 and selecting the specific materials of the inner and outer parts. The inner part is formed of an electrically conductive material, e.g. amorphous carbon, ***which causes substantially no reaction product by***

> ***contact with an etching gas***, or an electrically conductive material which does not cause, at least, any reaction product which is substantially adsorbed on an etching target, by contact with an etching gas. The outer part is formed of a material containing a component which is a main component of the etching target and ***causes such a reaction product as to be substantially adsorbed on the etching target*** by contact with an etching gas, preferably, a metallic material.

Here, the description here of an amorphous carbon "which causes substantially no reaction product by contact with an etching gas" or the material of the outer part "which . . . causes such a reaction product as to be substantially adsorbed on the etching target by contact with an etching gas, preferably, a metallic material" also in no way discloses or suggests and indeed teaches away from an erodable focus ring component.

Thus, the polymeric, erodible properties of the claimed cylindrical unit are the **opposite** of the electrical conductive, resistant to etching gas properties of the focus ring(s) in Hasegawa et al. The Court in In re Gurley, 31 USPQ2d 1130 (Fed. Cir. 1994) explained the legal standard for teaching away as follows:

> A reference may be said to teach away when a person of ordinary skill, upon reading the reference, would be discouraged from following the path set out in the reference, or ***would be led in a direction divergent from the path that was taken by the applicant***. The degree of teaching away will of course depend on the particular facts; in general, a reference will teach away if it suggests that the line of development flowing from the reference's disclosure is unlikely to be productive of the result sought by the applicant. [Emphasis added.]

Here, a person of ordinary skill, upon reading Hasegawa et al, would be led in a direction divergent from the path that was taken by the applicant (i.e., would be lead away from the claimed ***polymeric*** component ***configured to erode*** when exposed to a plasma process in said semiconductor manufacturing system).

THUS, HASEGAWA ET AL TEACH AWAY FROM THE CLAIMED INVENTION WHICH IS AN INDICIA OF NON-OBVIOUSNESS

2) In the outstanding final Office Action, the Examiner indicated that:

> In the instant case, while Hasegawa et al alone does not teach that the erodible component is a polymeric component, Examiner maintains that one of ordinary skill in the art, *taking the combined teachings of Hasegawa and Kumar et al into consideration*, would have found it obvious, with a reasonable expectation of success in obtaining the predictable and desirable result of ***releasing the active component of Kumar et al by erosion of the passive component of Kumar et al,*** to replace one or both of the focus rings 104, 106 of Figure 1 taught by Hasegawa et al or the focus ring 208d of Figure 8 taught by Hasegawa et al with the ring comprising an active material embedded in a passive material as taught by Kumar et al.

In response, Applicants pointed out below that all the descriptions in Kumar et al appear to be directed to the introduction of their plasma catalyst for the express purpose of plasma ignition. Kumar et al for example further describe at col. 9 that:

> One method of forming a plasma consistent with this invention can include subjecting a gas in a cavity to electromagnetic radiation having a frequency less than about 333 GHz in the presence of a passive plasma catalyst. A passive plasma catalyst consistent with this invention can include any object capable of inducing a plasma ***by deforming a local electric field*** (e.g., an electromagnetic field) consistent with this invention, without necessarily adding additional energy through the catalyst, such as by applying an electric voltage to create a spark.

Thus, if the plasma catalyst of Kumar et al were placed on a focus ring, the plasma activation medium in the plasma catalyst of Kumar et al would deform the local electric field and thereby affecting the plasma uniformity.

Furthermore, there is no basis to assume that "releasing the active component of Kumar et al by erosion of the passive component" would provide a uniform etching rate over the entire surface of the substrate to be processed. Indeed, it seems more likely that releasing of reactive species of Kumar et al nearby the periphery of the substrate would likely distort the etching rate near the periphery of the substrate.

In either case, the results of this proposed modification suggested by the Examiner would be contrary to the purpose of Hasegawa et al to provide a uniform etching rate over the

entire surface of the substrate to be processed. See col. 1, lines 61-64, of Hasegawa et al.

The Court in *In re Gordon*, 733 F.2d 900, 221 USPQ 1125 (Fed. Cir. 1984) explained that:

> If proposed modification would render the prior art invention being modified unsatisfactory for its intended purpose, then there is no suggestion or motivation to make the proposed modification.

THIS IS ANOTHER INDICIA OF NON-OBVIOUSNESS.

3) Finally, in the Advisory Action, the Examiner cites "Kava" and states that:

> Kuvar suggests that an electrically insulative coating is suitable for use on a foucus ring, but one of ordinary skill in the art, in combining the teachings of Hasegawa, Kumar, and Kava, could embody those teachings in multiple ways, such as only placing the coating on the surface of the focus ring not required to erode and not placing the coating on a surface intended to erode.

It thus appears that the Examiner is now making a new art rejection based on the combination of "Hasegawa, Kumar, and Kava."

However, Kava et al (U.S. Pat. No. 5,474,649) also teach away from the claimed passive polymeric component configured to erode when exposed to a plasma process in said semiconductor manufacturing system. Kava et al teach a textured focus ring surface which stabilizes and retains residues, not an erodible surface. In Kava et al, the focus ring is textured to maintain a coating on the surface of the focus ring. Kava et al states at col. 3, lines 14-19, that:

> Because a focus ring has proximity to the workpiece/surface substrate and, consequently, is more susceptible to contaminant build-up in plasma etch processing, it is desirable to provide a focus ring which accommodates and stabilizes coatings of contaminant residues and requires less frequency of cleaning.

THUS, KAVA ET AL ALSO TEACH AWAY FROM THE CLAIMED INVENTION WHICH IS ANOTHER INDICIA OF NON-OBVIOUSNESS